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## Examining the Prevalence and Predictors of Injury from Adolescent Dating Violence

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### Abstract

Medical needs of youth who experience dating violence are not well understood because of limited past research examining the prevalence and predictors of injuries and medical help seeking. To address these gaps, the current study described the prevalence and predictors of injuries from dating violence from grades 8 through 12 in a large sample of youth. Results indicate that one third to one half of youth who experienced any physical and/or sexual dating violence also sustained an injury. Prevalence of injury was highest in the 8<sup>th</sup> grade and was significantly higher for females than for males across grades 8 through 11. Youth who experienced greater amounts of

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violent victimization in their relationships (physical, sexual, and psychological) were at highest risk for injury. Results also suggest that victims at highest risk for injury are girls, white youth, those experiencing multiple types of violence, and those who also engage in perpetration. Given the high prevalence of injury among youth who report dating violence, healthcare professionals may be in a unique position to screen and counsel youth about dating violence. Because the highest prevalence of injury occurred before high school, prevention programs should start early and selected prevention may be used for youth at highest risk for injury.

## Keywords

injury; dating violence; medical help seeking; victimization

Violence in adolescent dating relationships can be psychological, physical, sexual or may involve stalking behaviors (CDC, 2014). Among youth who reported dating in a national survey administered in 2013, approximately 10.3% (13.0% girls, 7.4% boys) of high school youth reported experiencing physical dating violence and 10.4% (14.4% girls, 6.2% boys) reported experiencing sexual dating violence in the 12 months prior to the survey (Kann et al., 2014). The consequences of dating violence can potentially be severe. Experiences of dating violence have previously been positively associated with a variety of long-term mental health, emotional, and behavioral problems including symptoms of depression and anxiety, substance use, antisocial behavior, suicidal ideation, other forms of interpersonal violence, and re-victimization during college (Bossarte, Simon, Swahn, 2008; Exner-Cortens, Eckenrode, & Rothman, 2013; Foshee et al., 2013; Roberts, Klein, & Fisher, 2003; Smith, White, & Holland, 2003; Swahn, Simon, Hertz et al. 2008). Physical injury is also a potential consequence of dating violence, just as it is from other forms of fighting (Hammig, Dahlberg, Swahn 2001). However, there are limited findings on physical injuries and medical treatment seeking for injuries resulting from adolescent dating violence episodes. Such information would inform whether healthcare settings could be appropriate places for intervention.

Only a few studies with adolescent samples have examined dating violence-related injuries and medical help seeking among physically injured youth. These studies have been cross-sectional analyses that bundled youth across grades. Analyzing data as cross-sectional loses important characteristics of the data, such as whether or not the injury and the violence occurred during the same time period. In addition, the meaning and context of dating changes as youth age. For example, younger youth may “date” by participating in social events as groups, whereas older youth may date as couples rather than groups (Child Trends, 2015). The context of dating may also influence the opportunity for violence. Therefore, comparing prevalence estimates from studies that aggregate data across grades or age may give the appearance of mixed results because the likelihood of experiencing injury from dating violence may fluctuate over adolescence and aggregating youth of different ages obscures such nuances. For example, the prevalence of physical dating violence increases through adolescence and peaks at approximately age 17–18, so it is possible that the prevalence of injuries mirrors this trajectory (O’Leary & Slep, 2012).

Aggregating youth from different grades may also account for the mixed results for gender differences in injury reported in previous studies. As described below, a few studies have found no gender differences in injuries received from dating violence (e.g., Callahan et al., 2003) and others have found that boys are more likely to injure a partner than girls (Archer, 2000). For example, O'Leary and colleagues (2008) did not find gender differences in prevalence of injuries in aggressive dating relationships among a large sample (N = 2,363) of 15–18 year old youth from 7 multiethnic high schools. In this sample 26% of females and 30% of boys in these types of relationships reported being injured by their partner. Furthermore, they found that only 3% of injured youth sought medical care for their injury. Swahn et al. (2008) studied dating violence among students in grades 7, 9, and 11/12 residing in a high-risk school district, and found that there were no differences between boys and girls in reports of receiving injuries due to dating violence (2% for boys and 3% for girls). In contrast, boys were more likely than girls to report perpetrating injuries on their dating partner (2.7% of boys and 1.2% of girls).

Callahan et al. (2003) examined the frequency and severity of injuries from dating violence among 13–19 year old youth from a southern Michigan high school and found that youth reported primarily minor injuries, with 32% of girls and 29% of boys who experienced dating violence reporting one injury, and 9% of girls and 15% of boys reporting two injuries (gender differences were not significantly different). Combining youth of varying grades/ages might account for differences in prevalence and gender differences in injuries across studies. The preponderance of the research on injuries from adolescent dating violence has focused on describing the prevalence of injuries and comparing prevalence by gender. Few studies have examined whether there are factors that predict the likelihood of receiving an injury from dating violence, yet, it is clear that some adolescents in violent dating relationships sustain injuries, whereas others do not. Understanding the factors that increase the likelihood of injury may help identify youth at high risk for injury, assist in developing screening for injury, or may identify factors to be addressed with targeted prevention or intervention.

In previous research, demographic characteristics such as female sex, racial/ethnic minority status, and older grade/age have been risk factors for adolescent dating violence victimization (Coker et al., 2000; O'Leary & Slep, 2012), albeit with some mixed results across studies, but no research has explored whether these factors predict injury risk. Patterns of dating also vary by gender (boys more likely than girls to date frequently in 8<sup>th</sup> grade), race/ethnicity (White students more likely than African American students to date frequently in 12<sup>th</sup> grade but less likely than African American and Hispanic students to date frequently in 8<sup>th</sup> grade), and parental education (higher parental education may be associated with less frequent youth dating) (Child Trends, 2015) suggesting these variables are important to consider when exploring changes in dating violence over time. Studies of young adults and adults suggest that victims of intimate partner violence are more likely to be injured if they are also perpetrators (Capaldi et al., 1997; Whitaker et al., 2007) and when they experience multiple types (e.g., physical, psychological and sexual) as compared to only one type of partner violence (Amar et al., 2005). These findings suggest that there may be characteristics of abuse that increase risk for injury. However, to our knowledge, no studies of adolescents have examined whether demographic factors or characteristics of the

violence, such as the perpetration status of the victim or the number of types of violence the victim is experiencing, is associated with the likelihood of receiving an injury from dating violence.

Building on these previous studies, the current study has two aims. Due to the fact that there are mixed results for prevalence of injuries by gender among studies that aggregated youth in different grades, our first aim uses data spanning grades 8 through 12 to describe the prevalence of sustaining an injury from dating violence and/or seeking medical attention for such an injury by gender and grade-level. Results are provided for the overall sample (aim 1a) as well as for a subsample of youth reporting forms of violence that could lead to injury—physical or sexual dating violence victimization (aim 1b). For our second aim, we examine predictors of injury across grades 8 to 12 among dating violence victims. More specifically, we determine if the same demographic characteristics that are associated with dating violence victimization are also associated with injury across grades 8 to 12 (aim 2a). Furthermore, we determine whether the probability of injury is elevated at specific junctures, such as when the victim is also a perpetrator and when the amount of physical/sexual and psychological dating violence victimization is higher (aim 2b). We also assess whether having multiple versus single types of dating violence is associated with increased probabilities of injury across grades 8 through 12 (aim 2c).

## Methods

### Study Overview

The analyses for this study use data from 917 adolescent participants in the control group of a randomized trial evaluating the effects of a dating abuse prevention program, Safe Dates (Foshee et al. 1996). In the Safe Dates RCT, 8th and 9th graders enrolled in one of 14 public schools in one primarily rural North Carolina county were eligible for the study at Wave 1. At Wave 1 (W1; fall semester 1994), parental consent was obtained from 84% of eligible adolescents and questionnaires were completed by 96% of adolescents whose parents consented. Five waves of data were subsequently collected in the eighth grade cohort (cohort 1) and four waves of data were subsequently collected from the ninth grade cohort (cohort 2) until both cohorts were in the 12<sup>th</sup> grade (cohort sequential design). Attrition from baseline by Wave 3 was only 12%, but by wave 6 was about 50% largely because the study was required to re-obtain active parental consent at wave 4 which resulted in a drop in study participation rates (see Foshee et al. 2005). Attrition analyses examining predictors of drop-out at any wave (using a multivariate logistic regression model) suggest that drop-out was significantly less likely among those who reported higher levels of parent education but was unrelated to sex, race/ethnicity, and baseline dating abuse victimization or perpetration.

As is common practice with cohort sequential designs (e.g., see, Foshee et al., 2008), for analysis purposes, data were reorganized by grade rather than wave allowing for us to examine developmental trends in victimization/injury. In particular, the analytic sample from the current study draws from waves 2 through 6 for cohort 1 (which correspond to assessments at the end of grades 8,9,10,11 and 12) and waves 3 through 6 for cohort 2 (which correspond to assessments at the end of grades 10, 11, and 12). Thus, only cohort

one contributes to data at grades 8 and 9 where as both cohorts 1 and 2 contribute data in grades 10, 11 and 12.

Students who were absent for school data collection, including those who had dropped out of school, were mailed a questionnaire to complete and return. Schools were provided with a modest incentive each year for participating in the study. No incentives were provided to teachers or students. The study was approved by all relevant IRBs.

## Measures

The dating violence measures, injury, and medical help-seeking were assessed using a lifetime reference period at W1 and W2 and a past-year reference period in all other waves. The dating violence measures and injury were assessed across all waves; medical help-seeking was only assessed in W1 to W4.

**Adolescent Dating Violence (DV) victimization**—Physical, sexual, and psychological dating violence (DV) victimization were assessed using the Safe Dates victimization scales (Foshee et al., 2006). The scale includes the following instructions followed by item assessing each form of violence (described in detail below): “How many times has any person that you have been on a date with done the following things to you? Only include it when the dating partner did it to you first. In other words, don’t count it if they did it to you in self-defense.” Response options on these items ranged from never (0) to ten or more times (3).

**Physical DV victimization:** Physical DV victimization was assessed by asking adolescents sixteen items that ranged from relatively mild acts (e.g., “scratched me”, “slapped me”) to more severe acts (e.g., “beat me up”). Responses were summed and then a binary measure was created indexing any physical victimization (1=yes; 0=no).

**Sexual DV victimization:** Sexual DV victimization was assessed with two items: “forced me to have sex,” and “forced me to do other sexual things that I did not want to do.” Responses to these items were summed and then a binary measure was created indexing any sexual victimization (1=yes; 0=no). In addition, items from the Physical and Sexual DV victimization scales were summed to create a continuous variable of the number of sexual and physical DV episodes experienced (Wave 1 Cronbach’s alpha = .96).

**Psychological DV victimization:** Fourteen items were used to assess psychological DV victimization (e.g. “insulted me in front of others,” “would not let me do things with other people”). Responses to these items were summed to create a psychological DV victimization score (Wave 1 Cronbach’s alpha=.93) and dichotomized to create a binary measure indexing any psychological victimization (1=yes; 0=no).

**Polyvictimization:** For youth reporting victimization, we used the victimization measures described above to create the following measure of polyvictimization: a score of “0” was assigned if the respondent reported having experienced only one type of victimization; a score of “1” was assigned if the respondent reported having experienced two types of victimization; a score of “2” was assigned if the respondent reported having experience all

three types of victimization. This scoring method is consistent with other measures of polyvictimization (Finkelhor, Ormand, Turner, & Hamby, 2005).

**Physical and Sexual DV perpetration**—A variable was created at each wave to indicate whether the adolescent had perpetrated any physical/sexual dating violence. The same 18 questions used to assess physical and sexual dating violence victimization were asked in reference to perpetration. Responses to these items were summed (Wave 1 Cronbach's  $\alpha=.96$ ) and then dichotomized to create a binary measure indexing any involvement in physical/sexual DV perpetration.

**DV injury**—Dating violence injury was assessed by one item asking, "How many times have you been injured (for example a bruise, a burn, a cut, or a broken bone) because of things that a dating partner did to you on purpose?" Response options ranged from never (0) to more than five times (3). Responses to this item were dichotomized to create a binary measure indexing whether the youth had been injured as a result of DV (1=yes; 0=no).

**DV medical help-seeking**—DV medical help-seeking was assessed by one item asking, "Have you gone to a doctor or to the emergency room with injuries you got from violence by a dating partner." Response options were yes (1) or no (0).

**Demographic variables**—Demographic variables included in the analyses included race/ethnicity, which was dummy coded as black or other race ethnicity (white was the reference group); sex (1=male; 0=female); and parent education (highest of mother's or father's: 0=less than high school, 1=high school graduate, 2=more than high school), which was averaged across waves.

## Analytic Strategy

Analyses for this study combined control group data collected from cohort 1 ( $n=418$ ) in W2 (spring 8<sup>th</sup> grade; life-time reference period for DV measures), W3 (spring 9<sup>th</sup> grade), W4 (spring 10<sup>th</sup> grade), W5 (spring 11<sup>th</sup> grade), and W6 (spring 12<sup>th</sup> grade) and data collected from cohort 2 ( $n=499$ ) in W3 (spring 10<sup>th</sup> grade), W4 (spring 11<sup>th</sup> grade), and W5 (spring 12<sup>th</sup> grade). This allowed us to assess victimization, injury, and medical help-seeking rates across grades 8 through 12 using a life-time reference period for the grade 8 measures and a past-year reference period for grades 9 through 12 (total  $n=917$ ). Within each grade there were a small number of adolescents who were missing data on physical/sexual DV victimization or injury (average of 2% across grades) who were dropped from analyses.

The sample sizes available for the total sample available at each grade ranged from 394 to 741 are described in Table 1 by grade-level and sex (columns 1 to 3). At each assessment, the sample of DV victims was defined as being comprised of those adolescents who reported having ever dated and experienced any physical/sexual DV victimization at that grade-level (Table 1, columns 4 to 6); the criteria of having experienced any physical/sexual DV was used to define the victims sample because both types of aggression are "physical" in nature and thus have the potential to lead to injury.



To address the first aim, we calculated rates of DV injury and medical help-seeking within each grade and among boys and girls for the total sample and among those reporting any physical/sexual DV victimization in each grade. Sex differences in rates were assessed using chi-square tests; Fisher's exact test was used where expected cell frequencies were less than five.

To address the second aim, we used a two-level generalized linear mixed modeling approach to examine predictors of injury among those who reported ever dating and any physical/sexual DV victimization at each grade-level. As a first step, we used SAS PROC GLIMMIX to estimate an unconditional trajectory model for injury that included a fixed effect for grade-level (centered at grade 8) as well as a random intercept. The fixed effect of grade was significant and negative indicating that the probability of DV injury among victims decreased linearly across grade-levels. Second, we estimated three conditional models; the first model (Model 1) included the demographic variables (sex, race, and parent education) as time-stable (level 2) predictors of DV injury (to assess aim 2a). The second model (Model 2) built on model 1 to add predictors indexing the amount of physical, sexual, and psychological DV victimization reported at each grade as well as involvement in any physical/sexual DV perpetration as time-varying (level 1) predictors of injury (to assess aim 2b). We then examined interactions between each of these time-varying predictors and sex as predictors of injury; significant interactions ( $p < .05$ ) were retained in the final reduced model.

Finally, to address aim 2c, we estimated a third model that built on model 1 to include polyvictimization as a time-varying (level 1) predictor of injury. Across all models, continuous time-varying predictors were person-mean centered and person-means were included as controls at level 2 to ensure that parameter estimates denote within-person (time-varying) effects of each predictor on the likelihood of injury at each grade-level. Models were fit using maximum likelihood estimation techniques that make use of all available information in the data and provide unbiased parameter estimates under the assumption that data are missing at random.

## Results

The total sample ( $n=917$ ) was 49% male, 20% black, and 4% other race/ethnicity. Table 1 provides sample sizes and physical/sexual DV victimization prevalence rates for each grade-level and by sex. With regard to the overall prevalence of physical/sexual DV victimization, 85 youth reported having ever been victimized prior to the spring of the 8<sup>th</sup> grade, which is 21.4% of those assessed at that grade-level. Past year victimization rates stayed relatively flat and ranged from 29% (grade 9) to 32% (grade 12); victimization rates did not differ for boys and girls within any grade-level.

### Aim 1 Findings

Table 2 describes the prevalence of injuries among the full sample and among those who reported any physical/sexual DV victimization. With regard to overall prevalence of injury, 46 youth reported having ever been injured as a result of DV prior to the spring of the 8<sup>th</sup> grade, which represents 11.6% of the total sample and 54% of those reporting having ever

been victimized. Past year injury rates stayed relatively flat in the total sample (range 11.3% to 12.8%), but declined significantly among those reporting victimization from 54% in the 8<sup>th</sup> grade to 33% in the 11<sup>th</sup> and 12<sup>th</sup> grades. Across nearly all grades (grade 12 was the only exception), females were significantly more likely than males to report injury from DV.

As medical help-seeking was not assessed in Waves 4 or 5, data for this measure are only available across grades 8 through 11 and grade 11 data were only available from cohort one (n=305). Seven youth reported ever having sought care from a doctor or hospital for injuries sustained as a result of DV prior to the spring of the 8<sup>th</sup> grade, which represented 1.8% of the 8<sup>th</sup> grade sample and 8.2% of those who reported having experienced physical/sexual DV victimization prior to the spring of the 8<sup>th</sup> grade. Medical help-seeking stayed relatively flat across grade-levels in the total sample, but significantly declined among victims; in the 11<sup>th</sup> grade, 4.9% of physical DV victims reported medical help-seeking. In the 8<sup>th</sup> grade, male DV victims were significantly more likely than female victims to report medical help-seeking (6 males vs. 1 female; exact p=.04); however, there were no significant sex differences in medical help-seeking in any other grade-levels.

## Aim 2 Findings

Table 3 provides the results of generalized linear mixed models examining predictors of injury across grades 8 through 12 among those reporting any physical/sexual DV victimization. Model 1 reports findings addressing aim 2a. Injuries were negatively associated with grade, male sex, and black race; meaning that the probability of injury significantly decreased across grade-levels and that girls and white DV victims were significantly more likely to experience injuries (Table 3, Model 1) than boy victims and victims who were black, respectively. Model 2 reports findings assessing aim 2b. As expected, findings from model 2 suggest that the likelihood of injury was elevated at time points when physical/sexual (p=.003) DV victimization was increased; however, these effects were conditioned by sex (p=.04). In particular, simple slopes analyses suggest that elevated physical/sexual victimization scores were associated with increased injury risk for girls (adjusted odds ratio (AOR)=1.12, 95% confidence interval (CI) 1.04, 1.21, p=.003), but were only marginally associated with injury risk for boys (AOR=1.03, 95% CI 0.99, 1.07, p=.06). In addition, increased psychological DV victimization (p=.03) and involvement in any physical/sexual DV perpetration (p=.03) were associated with increased risk for DV injury and these effects did not differ for boys and girls.

Results from models examining the association between polyvictimization and injury risk (aim 2c) suggest that injury was associated with experiencing three (psychological, physical, and sexual) forms of violence as compared to experiencing only one form of violence (AOR = 13.89, 95% CI 2.17, 88.96, p= .006). No significant difference in injuries was found for experiencing two types of violence compared to one (AOR = 2.17, 95% CI 0.72, 11.33, p = .13).

## Discussion

Although several studies have examined psychological, behavioral, and developmental consequences of adolescent dating violence victimization (e.g., Banyard and Cross, 2008;



Button and Miller, 2013; Chronister et al., 2014; Collibee and Furman, 2014; Foshee et al., 2013; Holmes and Sher, 2013; Teten et al., 2009; Ulloa et al., 2014), very few have examined injury as a consequence. This study is a first step in addressing gaps in the field related to understanding injuries sustained by victims of dating violence. We found that approximately one third to one half of youth who experienced any physical and/or sexual dating violence were physically injured. Prevalence of injury was highest in the 8<sup>th</sup> grade and was significantly higher for females than for males across grades 8 through 11. It should be noted that although the reference period for this measure in 8<sup>th</sup> grade was lifetime (vs. past year) it is unlikely that the exposure period contributed to significant differences with one-year estimates, given that dating typically does not begin until middle school. Past work is mixed in terms of gender differences in injury (Archer, 2000; Callahan et al., 2003) and the shift from grades 8–11 to 12 may explain the mixed findings, such that studies that aggregate across grades lose the change over time in gender differences. Higher levels of physical/sexual and psychological dating violence victimization predicted increased injury risk, although associations between physical victimization and injury were stronger for girls than for boys. In addition, among both boys and girls, perpetration of physical/sexual dating violence was uniquely associated with increased injury risk across all grades. Gender differences were not found for seeking medical attention for an injury, with the exception of 8<sup>th</sup> grade, when boys were more likely to seek medical attention for an injury. This finding differs from previous research that has found that emergency department visits for dating violence injuries are more common among girls (Singh et al., 2014). Although the youth in our study may have sought medical care in places other than an emergency department, the effect for boys is striking and should prompt further rigorous exploration into gender differences in early adolescent medical treatment seeking for dating violence. Also, our results suggest that some populations are particularly at high risk and they may be in need of extra attention. Victims at highest risk for injury are girls, white youth, those already experiencing multiple types of violence, and those who are also engaging in perpetration; these populations might benefit from timely and targeted dating violence prevention programs especially if dating violence has already begun.

The amounts of each form of dating violence victimization and perpetration were associated with injuries. Interestingly, experiencing psychological violence was uniquely associated with injury risk controlling for amount of physical/sexual DV victimization; and, experiencing three types compared to one type of violence was associated with injury. These findings suggest that, among youth who are experiencing any physical/sexual DV victimization, those who are experiencing higher levels of psychological victimization are particularly at risk for injury. This may be because higher levels of psychological victimization may be associated with the perpetration of more intense or severe forms of physical/sexual victimization. That is, we controlled for the amount of physical/sexual victimization being experienced but because psychological victimization was a predictor over and above the influence of amount of physical/sexual DV it suggests it may be tapping into an additional dimension of the victimization experience that is associated with injury risk. It is possible that those who are experiencing greater degrees of psychological victimization are in relationships in which the power and control dynamic inhibit them from being able to de-escalate conflict or feeling that they can seek help safely. Furthermore, the

youth who experienced three forms of violence reported the highest frequency of violence. Experiencing multiple forms of violence may be a marker of severe violence as well as potential injury, which may inform screening for violence in healthcare systems. Youth who report experiencing multiple forms of violence may benefit from counseling and additional resources given their higher risk for injury.

Our finding that physical/sexual DV perpetration predicted injuries is consistent with past work from the adult literature that found perpetrating violence increases one's risk for sustaining injury (Capaldi et al., 1997). Perpetrating physical/sexual DV may escalate and intensify conflicts such that injuries are more likely to occur. Similarly, injury prevention efforts should also consider violence that may occur across relationship contexts as research has emerged to clearly demonstrate that violence is not relationship or context specific (Swahn 2010).

Many dating violence injuries were reported in middle school aged children, which suggests that pro-social dating behaviors and respect for relationships and partners need to be taught early in adolescence before maladaptive violent dating patterns develop (Teten Tharp et al., 2011). Some programs have shown promise and, traditionally, schools have been the primary setting for dating violence prevention programs (De La Rue, Polanin, Espelage, & Pigott, 2014). Some newer programs such as *Families for Safe Dates* have also engaged parents (Foshee, Reyes, Ennett, et al., 2012). In addition to school based programs, our study also underscores the need to engage medical facilities and healthcare professionals in prevention, screening, and intervention for dating violence. The prevalence of injuries suggest that healthcare providers may be in a unique position to identify and counsel youth in violent dating relationships.

Understanding the economic cost of violence is often helpful in making the case for prevention. However, currently no cost estimate for dating violence exists. Clues about the cost for dating violence can be estimated for the schools and communities participating in this study. Although youth who sought medical care may not have accessed this care in an emergency department (ED), only cost data for ED visits exist for youth injuries related to assault. As an illustrative example of potential costs of dating violence-related injuries, we use this ED data and estimate costs based on the prevalence of injury found in this study. Based on number of youth who were injured and sought medical care, using 2010 costs per emergency department (ED) visit for assault among youth 13–18 (\$2,697 medical costs per ED visit, \$3,333 in work loss cost per visit for total cost per visit of \$6,029, WISQARS, 2015), in the current sample, estimated medical (and total) costs for youth who sought medical care were \$26,970 (\$60,290) in 8<sup>th</sup> grade, \$29,667 (\$66,319) in 9<sup>th</sup> grade, \$40,455 (\$90,435) in 10<sup>th</sup> grade, and \$16,182 (\$36,174) in 11<sup>th</sup> grade. If all youth who experienced injuries had sought medical care, costs for this single community would have been up to \$256,215 (\$572,755) at the time of the highest prevalence of injuries in 10<sup>th</sup> grade. Considering that this study was conducted in a rural community, these costs may pose substantial burden to the healthcare system. Given the limitations outlined above of this cost estimate, estimated costs for dating violence-related injuries warrant further study; however, this estimate provides clues about the economic burden that dating violence may pose to communities.

Several interpretive caveats warrant discussion. First, this study used a rural sample and results may not generalize to suburban or urban youth. Second, the data were also collected nearly 20 years ago, which could limit their relevance. However, national estimates of dating violence, such as the Youth Risk Behavior Survey (Kann et al. 2014), suggest that the prevalence of physical dating violence has remained consistent since the late 1990's. It is unlikely that substantial changes in the prevalence or consequences of dating violence have occurred that would affect the findings. Despite the age of the data, few datasets exist that could be used to examine the current study questions. In addition, although analyses examined the associations between violence and injuries experienced in the same school year, we did not assess whether the violence and injury occurred in the same relationship. We also examined a limited set of predictors of violence. Future research should examine injuries associated with specific events of violence to further add to our understanding, as well other potential predictors such as alcohol use and perpetrator characteristics. In addition, the context of dating changes as youth age, so future work should explore how developmental changes in dating behaviors may affect dating violence and injury. Finally, due to some small sample sizes for some analyses, results yielded large confidence intervals. In addition to these limitations, it should be noted that the assessment of injury in 8<sup>th</sup> grade used a lifetime rather than a past year report as used in high school. The lifetime prevalence was selected because dating, dating violence, and injuries were anticipated to be low base rate events in middle school given the young age of the participants. However, our results suggest that subsequent work should attempt to assess past year prevalence of injuries among middle school youth. Although only a subset of youth reported dating during that time, their likelihood of experiencing an injury was high, suggesting more study of injuries in early adolescence is needed.

The consequences of dating violence are significant and the current study adds to our understanding about the prevalence and predictors of injuries sustained as a result of physical/sexual DV among youth from 8<sup>th</sup> grade through 12<sup>th</sup> grade. This study provides a more granular understanding of the burden of injury and gender differences in this burden across the late middle school through high school years. The findings suggest that dating violence is a significant risk to youth's health and well-being and that healthcare providers, parents, educators, and schools should be aware of the serious consequences of dating violence. These critical influencers may serve key roles in an adolescent's life by starting the conversation about dating violence before it begins, being a role model for healthy relationships, or being a trusted resource when violence has occurred. Engaging youth, their support systems, and their communities in prevention is a step towards ensuring safe, healthy, and injury-free relationships for young people.

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**Table 1**  
Sample size (n) and Prevalence (%) of Physical/Sexual Dating Violence Victimization by Grade and Sex

Grade	Sample size (n)			Victims (n, %)		
	T	M	F	T	M	F
8	397	199	198	85, 21.4	37, 18.6	48, 24.2
9	394	198	196	116, 29.4	56, 28.3	60, 30.6
10	741	351	390	220, 29.7	94, 26.8	126, 32.3
11	562	267	295	184, 32.7	89, 33.3	95, 32.2
12	542	253	290	175, 32.3	91, 36.1	84, 29.0

Note: T=total sample; M=males; F=females. Reference period for dating violence victimization was lifetime for 8<sup>th</sup> grade assessment and past year for all other grades.



Prevalence of Injury and Medical Help-Seeking by Grade and Sex in Full Sample and Among Those Who Reported any Physical/Sexual Dating Violence Victimization

Table 2

Grade	Injury (%)						Medical Help-Seeking (%)									
	Full Sample			Victims Sample			Full Sample			Victims Sample						
	T	M	F	χ <sup>2</sup>	T	M	F	χ <sup>2</sup>	T	M	F	χ <sup>2</sup>	T	M	F	χ <sup>2</sup>
8	11.6	6.5	16.7	9.95 <sup>***</sup>	54.1	35.1	68.8	9.51 <sup>**</sup>	1.8	3.0	0.5	3.61	8.2	16.2	2.1	5.52 <sup>*</sup>
9	11.4	7.1	15.8	7.45 <sup>**</sup>	37.1	23.2	50.0	8.91 <sup>**</sup>	2.8	4.0	1.5	2.29	9.5	14.3	5.0	2.91
10	12.8	9.7	15.6	5.86 <sup>*</sup>	39.6	29.8	46.8	6.54 <sup>*</sup>	2.0	2.6	1.5	0.98	6.4	8.5	4.8	1.27
11	12.1	7.9	15.9	8.58 <sup>**</sup>	33.7	21.4	45.3	11.76 <sup>***</sup>	2.0	2.0	1.9	0.01	4.9	4.2	5.5	0.09
12	11.3	11.1	11.4	0.01	33.7	29.7	38.1	1.39	--	--	--	--	--	--	--	--

Note:

\* p<.05;

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p<.01;

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p<.001.

T=total sample; M=males; F=females.

**Table 3**  
Predictors of Injury from Dating Violence (DV) Across Grades 8 Through 12 Among Those Reporting Any Physical/Sexual DV Victimization

Risk factor	Model 1			Model 2		
	AOR	95% CI	p-value	AOR	95% CI	p-value
<i>Demographic variables</i>						
Grade	0.84	0.74, 0.95	.007	0.86	0.75, 0.996	.04
Male (Female referent)	0.39	0.27, 0.55	<.001	0.29	0.18, 0.45	<.001
Black (White referent)	0.31	0.18, 0.52	<.001	0.23	0.12, 0.41	<.001
Other race (White referent)	0.99	0.43, 2.29	.97	0.87	0.36, 2.06	.74
Parent education	0.77	0.56, 1.05	.10	0.87	0.62, 1.22	.41
<i>Violence related factors (time-varying)</i>						
Amount of physical/sexual DV victimization	--	--	--	1.12	1.04, 1.21	.003
Amount of physical/sexual DV victimization X Male	--	--	--	0.92	0.86, 0.996	.04
Amount of psychological DV victimization	--	--	--	1.04	1.03, 1.07	.03
Any physical/sexual DV perpetration	--	--	--	1.82	1.05, 3.14	.03

Note: AOR=adjusted odds ratio; CI = confidence interval